NARRATIVE CARDIAC CATHETERIZATION REPORTS FROM A RELATIONAL DATA BASE MANAGEMENT SYSTEM

Kenneth S. Lerrick, M.D., F.A.C.C., New York Medical College, Valhalla, N.Y., Bruce B. Dworkin, Ph.D., Craig E. Monsen, M.D., F.A.C.C., Melvin B. Weiss, M.D., F.A.C.C., Michael V. Herman, M.D., F.A.C.C.

In order to generate an easily interpreted, narrative cardiac catheterization report, to enhance cath lab management and patient care, and to provide a database for research, we developed a relational data base management system. Data elements are drawn from right and left heart cardiac catheterization, left ventriculography, coronary and by-pass graft angiography, coronary angioplasty, aortography, and endomyocardial biopsy. The software is written in dHASE IV and runs on an IBM PS/2 microcomputer or a token ring local area network under Novelle Netware. It makes use of branching logic that follows the physician's decision making process for cardiac catheterization. The learning curve for new users is shortened by means of a menu driven interface and context sensitive help messages. The system is a research and clinical tool, using B+ tree indexing to support rapid retrieval of patient records and Boolean "And/Or" searches of the database. Data elements are expanded to produce a final report in a conventional narrative format, eliminating the need for tabular presentations of data and dictation. This narrative system has been used successfully in a cardiac catheterization lab performing approximately 3,500 patient procedures per year. It is well accepted by staff and referring physicians.

PEDIATRIC CARDIAC CATH STACK: A HYPERTEXT DATABASE FOR PEDIATRIC CATHETERIZATION DATA

Thomas D. Scholz, M.D., University of Iowa, Iowa City, IA

Pediatric cardiac catheterization data usually includes text, numerical calculations, and pictorial information. Pediatric Cardiac Cath Stack presents this information in an integrated, hypertext-type format. It was created using HyperCard, the database construction set for the Apple Macintosh. The program can be considered a hypertext database in that the user can readily recall numerical calculation data, the accompanying figure of the congenital heart lesion, the patient's history and physical examination, or a variety of "help" files.

Routine computations such as cardiac output, systemic and pulmonary resistances, shunt fractions, pulmonary artery (PA) indices, and valve areas are automatically calculated from available catheterization data and stored into the database. Selecting any of these values with the Macintosh's mouse displays the equations and data used to generate the result or its range of normal values. The program also maintains a library of diagrams of numerous congenital heart defects that saves the user the task of redrawing these lesions. Extensive on-line information is available to instruct the user in the techniques used to determine valve areas and PA indices or to assist in all aspects of the program's operation. Finally, the program generates reports which include history and physical examination information and a figure of the lesion with catheterization findings superimposed on the diagram.

Pediatric Cardiac Cath Stack is an integrated database, in a hypertext format, that provides rapid retrieval and review of the textual, numerical, and pictorial information needed to adequately describe pediatric cardiac catheterization data.

DEVELOPMENT AND IMPLEMENTATION OF A CATH LAB QUALITY ASSURANCE RELATIONAL DATABASE

J. Martin Pfaff, Ph.D., Neal L. Eigler, M.D., Clara Lu Brandt, R.N., James S. Whiting, Ph.D., Cedars-Sinai Medical Center, Los Angeles, CA

A quality assurance database (QA) has been developed in our catheterization laboratory which performs 3000 procedures annually by 35 attending physicians. QA allows a registered nurse with no previous computer experience, to enter or query data so that clinical/operational problems can be identified and resolved. A widely available database development package was chosen which supports: an intuitive window/menu environment, variable length and multivalued data fields, simultaneous data validation to assure data integrity, and popup windows to constrain data entry to pre-defined lists, as opposed to tedius keyboard entry. Pre-defined reports may be generated automatically or customized with an easy-to-use query procedure.

Currently, it takes 5 minutes/patient to enter 65 variables into QA including: patient demographics, operational parameters, attending staff, procedure date/time, indications, complications, fluoro/cine times, contrast type/dose, and pre/post diagnosis. The data is efficiently stored by transparent routines which convert textual selections into ICD-9 codes or numeric data. Disk storage for 3,800 currently entered procedures requires less than 2 MBytes without compression.

QA produces several summary reports which document performance and allow the selection of difficult cases for discussion at weekly meetings. QA was also used to rapidly detect an outbreak and subsequent control of staph-aureus infection. Research applications include the reporting and follow-up of patients undergoing therapeutic procedures (PTCA or LASER angioplasty) or patients involved in multiple procedures.

NEW SOCIETY FOR CARDIAC ANGIOGRAPHY AND INTERVENTIONS SOFTWARE PROGRAM

Claude Shaw, B.S., St. Joseph's Hospital Health Center, Syracuse, NY, Thomas J. Noto, M.D., Lewis W. Johnson, M.D., F.A.C.C. and SCAI Registry Committee

The SCAI Registry was established to monitor trends in cardiac catheterization and its complications. Data were first recorded on flow sheets and entered into a central computer. Later the format was changed to collecting data on computer cards which were read by an optically sensitive scanning card reader and analyzed with an IBM PC/AT Microprocessor. Over 300,000 patients were entered by these two methods. Because the card system is cumbersome data collection and analysis is now being changed to a fully computerized system. Hardware requirements include: (1) IBM PC or IBM compatible computer; (2) MS-DOS or PC-DOS version 2.0 or higher; (3) Ten megabyte hard disk or larger plus at least one 360K 5 1/4" or 720K 3 1/2" floppy disk drive; (4) 256K bytes installed memory. Participating laboratories will enter patient data on their computer. Data will be entered on six screens. The first three are for general information and must be completed for each patient. Screen 4 is for PTCA, screen 5 for valvuloplasty and the sixth is for complications. Each month the disk will be sent to the central computer and semi-annual reports will be generated and sent to the participating laboratories. Individual laboratory results will be compared with the entire registry including procedures performed, complications, factors contributing to complications, PTCA and valvuloplasty results. Laboratories will be able to use their own data for quality assurance and research purposes.